

FIG. 10

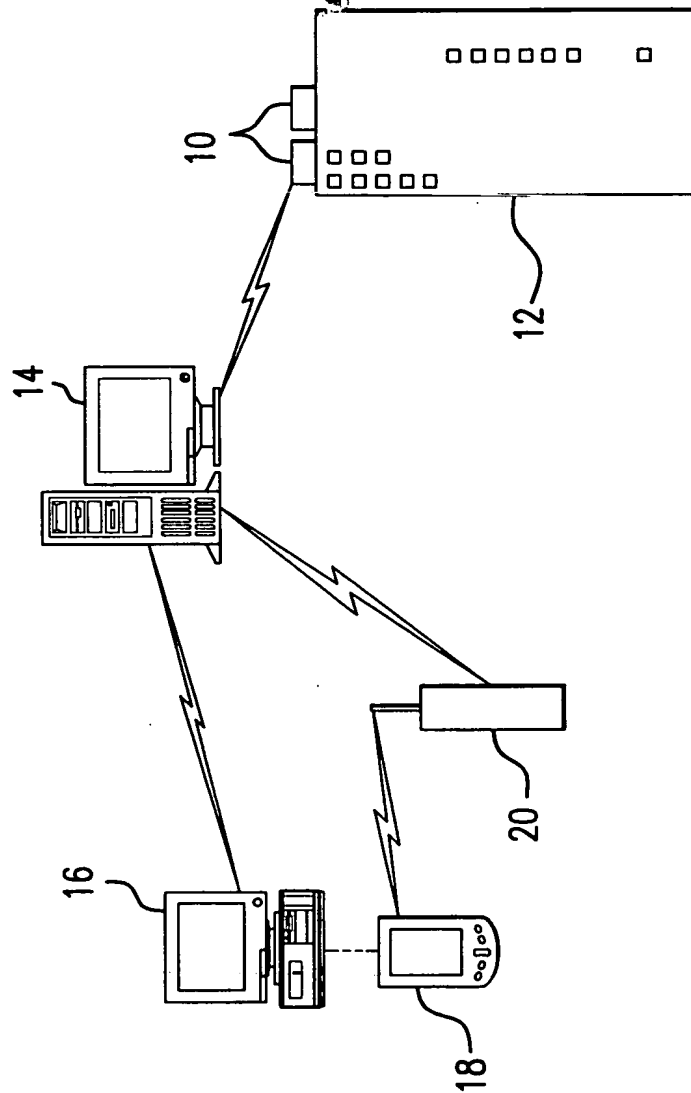


FIG. 1

204290" 5846E001

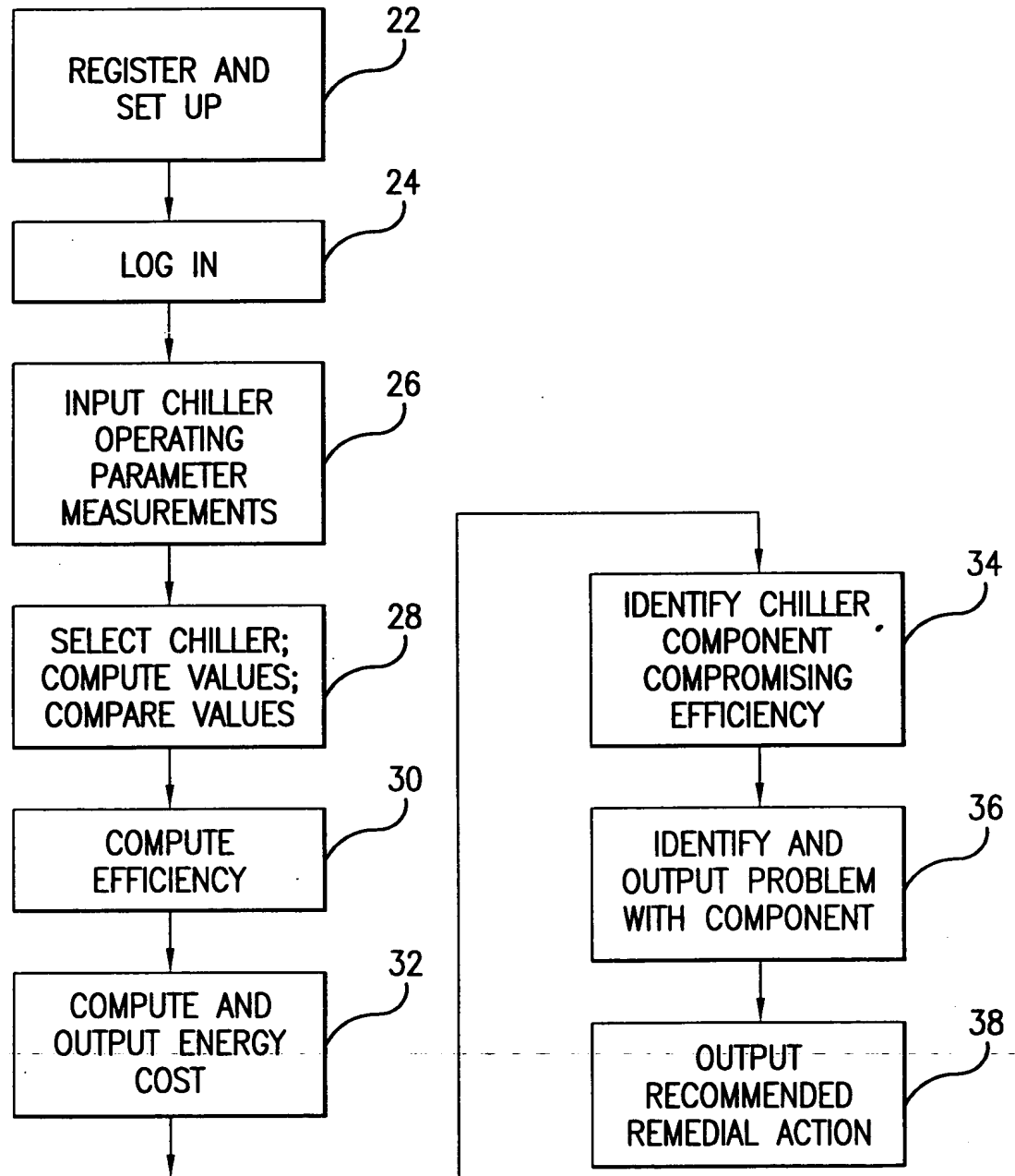


FIG.2

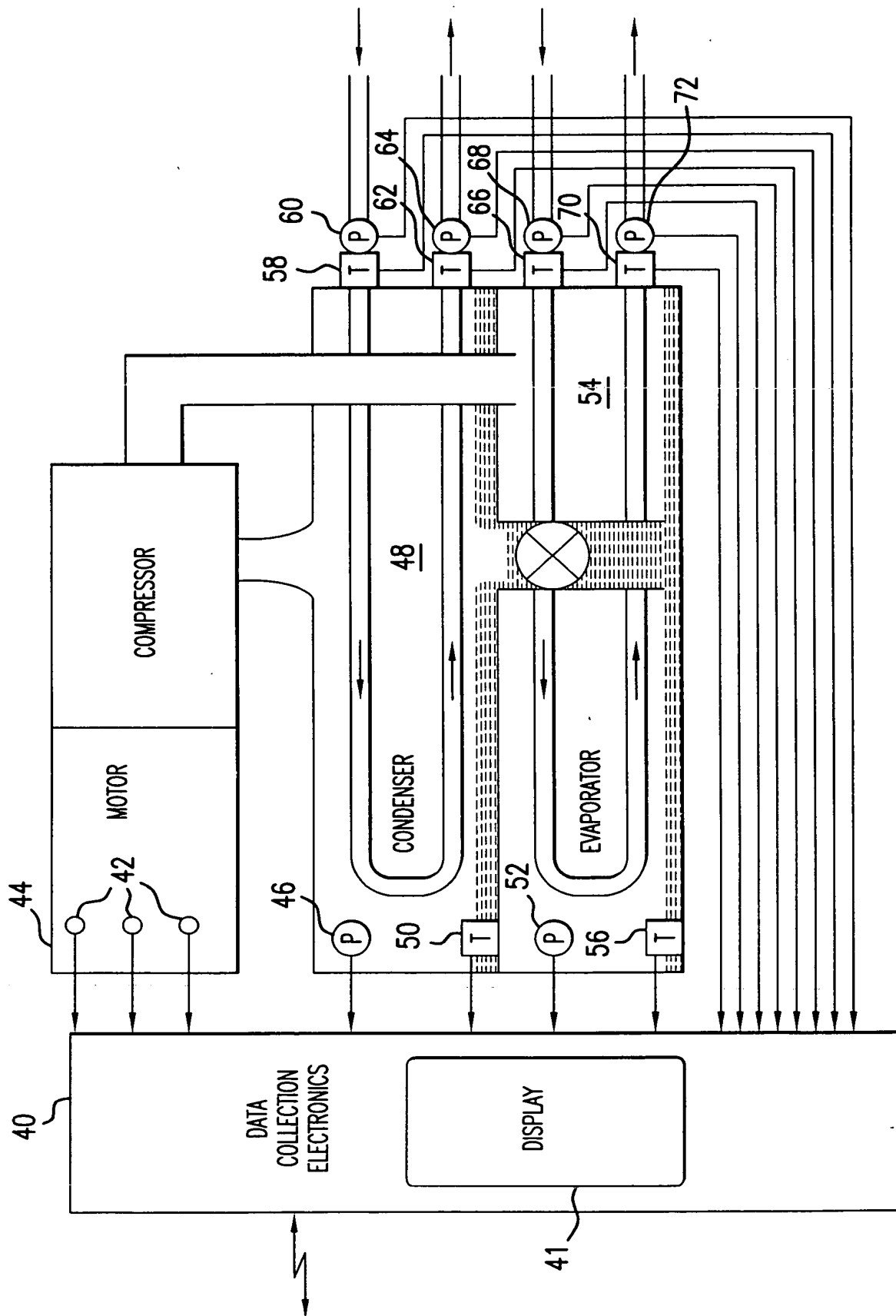


FIG.3

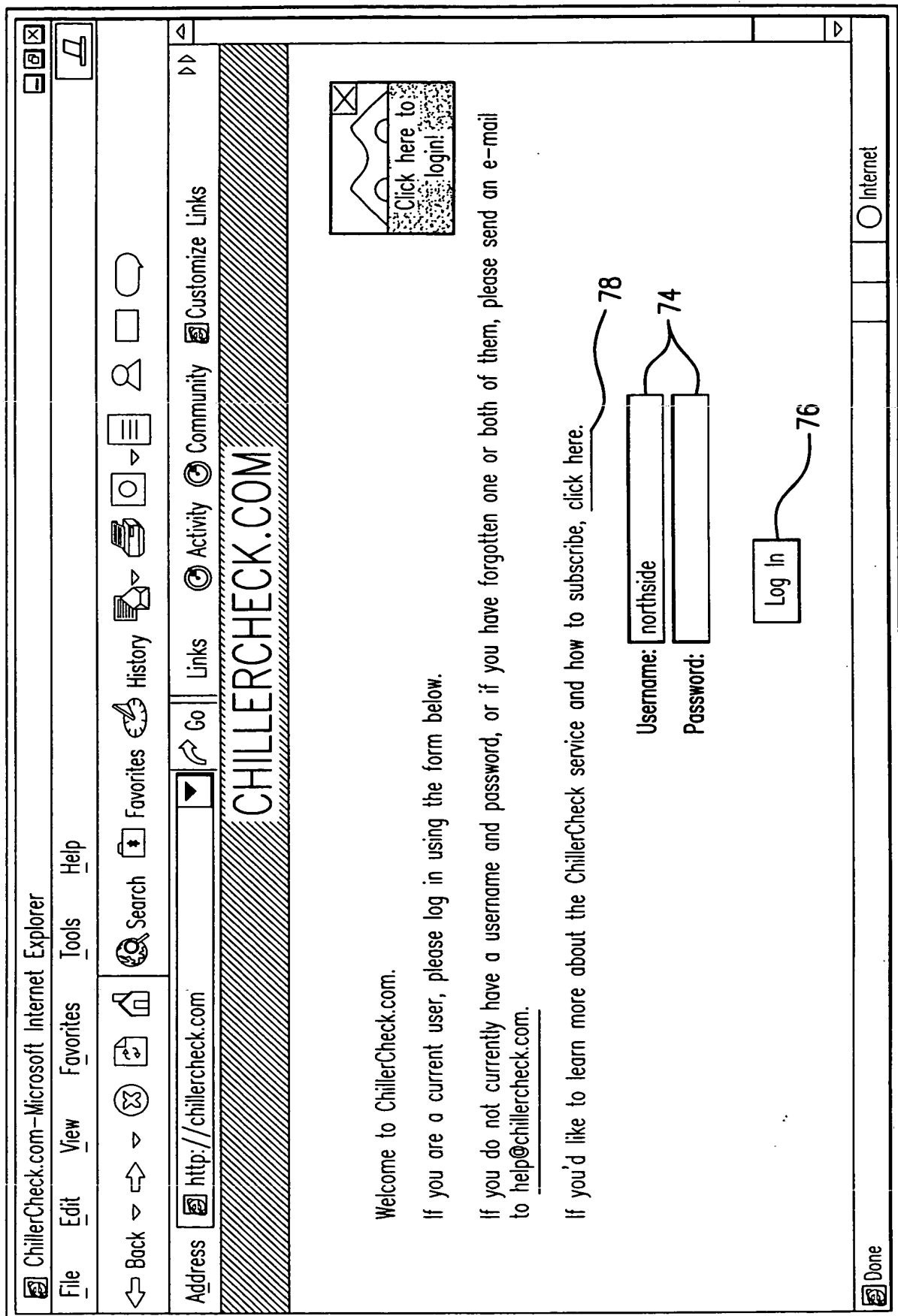
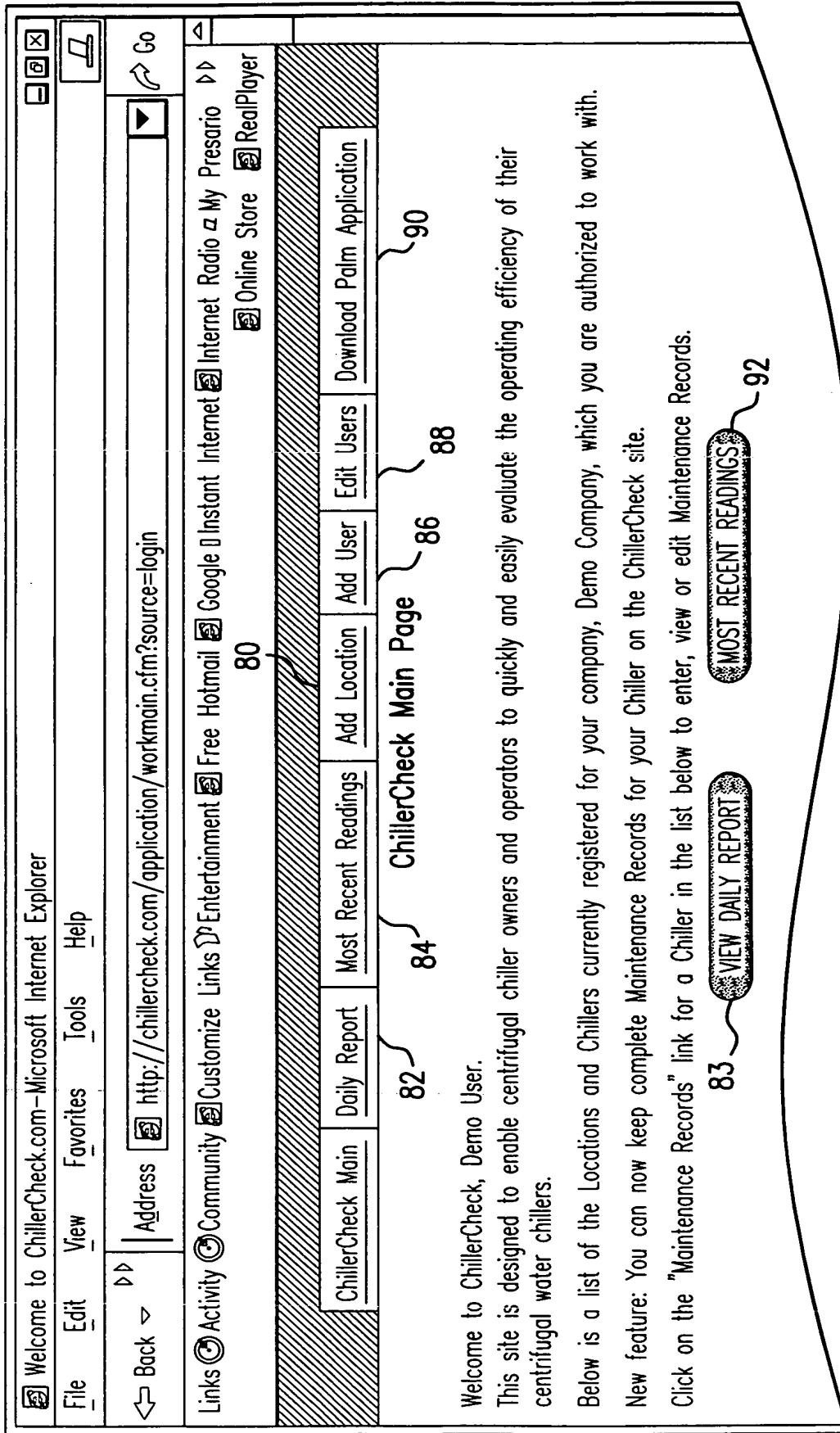


FIG. 4



CONT'D ON FIG.5-1

FIG.5

Please click on the appropriate link to work with the information below.

If a red * appears next to the Chiller #, some necessary information has not yet been set up for the chiller. Click on the "Alert" link to see details.

160	162	94	167	156	152	158
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FIG. 5-1

CHILLERCHECK.COM

ChillerCheck Main	Daily Report	Most Recent Readings	Add Location	Add User	Edit Users	Download Palm Application
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82 84 Add a Chiller at Atlanta Office Bldg. 80 86 88 90

Please fill in all information in the form below, then click the "Add Chiller" button.

You will then be taken back to the ChillerCheck Main page, where you can work with any of your Location, Chiller or Chiller Log records.

Note: If you do not have all the information below available at this time, you can still add the Chiller by filling out only the required information (marked with an * below) now. You can come back later and add the rest of the information. However, you will not be able to make efficiency calculations or graph trends until all Chiller information has been recorded.

Chiller Information

Help! * Chiller #:	<input type="text"/>	96
* Make:	Choose a Make ▾	98
Help! * Model:	<input type="text"/>	100
Help! Serial #:	<input type="text"/>	102
Help! * Refrigerant Type:	Choose a refrigerant ▾	104
Help! Year Chiller Was Manufactured:	Choose a year of manufacture ▾	106
Help! * Efficiency Rating (kw/ton):	<input type="text"/>	108
Help! * Energy Cost (\$/kw hour):	<input type="text"/>	110

FIG. 6A

10034785-062402

Help! * Weekly Hrs. of Operation:	<input type="text"/> ~ 112
Help! * Weeks Per Year of Operation:	<input type="text"/> ~ 114
Help! * Average Load Profile:	<input type="text"/> % ~ 116
Help! * Tons:	<input type="text"/> ~ 118
Help! * Design Voltage:	<input type="text"/> ~ 120
Help! * Full-Load Amperage:	<input type="text"/> ~ 122
<i>Now we need some information about the Condenser.</i>	
Help! Design Condenser Water Pressure Drop: (This value may be omitted if necessary, but your calculations will be more accurate if you have it. If you enter a value, you must choose a unit of measure.)	<input type="text"/> ~ 124 Choose a pressure unit ~ 126
Help! Please choose a unit of measurement for the Actual Condenser Water Pressure Drop:	Choose a pressure unit ~ 128
Help! Please choose a unit of measurement for Condenser Pressure:	Choose a pressure unit ~ 130
Design Condenser Approach Temp: (This Value may be omitted if you do not have it.)	<input type="text"/> ~ 132

FIG. 6B

10034785-052402

Now we need some information about the Evaporator.

<p>Help! Design Chill Water Pressure Drop: (This value may be omitted if necessary, but your calculations will be more accurate if you have it. If you enter a value, you must choose a unit of measure.)</p>	<div data-bbox="609 388 803 430" style="border: 1px solid black; width: 120px; height: 20px; display: inline-block;"></div> <div data-bbox="828 388 1177 430" style="border: 1px solid black; padding: 2px; display: inline-block;">Choose a pressure unit ▾</div> <div data-bbox="771 472 836 514" style="margin-left: 100px;">134</div> <div data-bbox="1136 472 1209 514" style="margin-left: 100px;">136</div>
<p>Help! Please choose a unit of measurement for the Actual Chill Water Pressure Drop:</p>	<div data-bbox="609 777 958 819" style="border: 1px solid black; padding: 2px; display: inline-block;">Choose a pressure unit ▾</div> <div data-bbox="1039 777 1104 819" style="margin-left: 10px;">138</div>
<p>Help! Please choose a unit of measurement for Evaporator Pressure:</p>	<div data-bbox="609 987 958 1029" style="border: 1px solid black; padding: 2px; display: inline-block;">Choose a pressure unit ▾</div> <div data-bbox="1039 987 1104 1029" style="margin-left: 10px;">140</div>
<p>Help! Design Evaporator Approach Temp: (This value may be omitted if you do not have it.)</p>	<div data-bbox="609 1176 803 1218" style="border: 1px solid black; width: 120px; height: 20px; display: inline-block;"></div> <div data-bbox="885 1176 950 1218" style="margin-left: 10px;">142</div>
<p>Help! Evaporator Design Outlet Water Temp:</p>	<div data-bbox="609 1407 803 1449" style="border: 1px solid black; width: 120px; height: 20px; display: inline-block;"></div> <div data-bbox="885 1407 950 1449" style="margin-left: 10px;">144</div>
<p>Please choose a method of calculating Oil Pressure Differential for the Compressor.</p>	
<p>Help! Calculate Differential by:</p>	<div data-bbox="609 1564 885 1606" style="border: 1px solid black; padding: 2px; display: inline-block;">Choose a method ▾</div> <div data-bbox="966 1564 1031 1606" style="margin-left: 10px;">146</div>

FIG. 6C

10034785-1062402

10034785.062402
204290 "SEIGEL"

There are just a few more things we need to know about this chiller.

Does the chiller have a readout for Purge Run Time?

☐ Yes

☐ No

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If so, is the Purge Run Time measured only in minutes, or in both hours and minutes?

☐ Minutes Only

☐ Hours and Minutes

145

Please set a maximum amount of Purge Run Time per day you wish to allow before you are sent an alert.

Minutes

147

Does this chiller have a readout for Bearing Temperature?

☐ Yes

☐ No

149

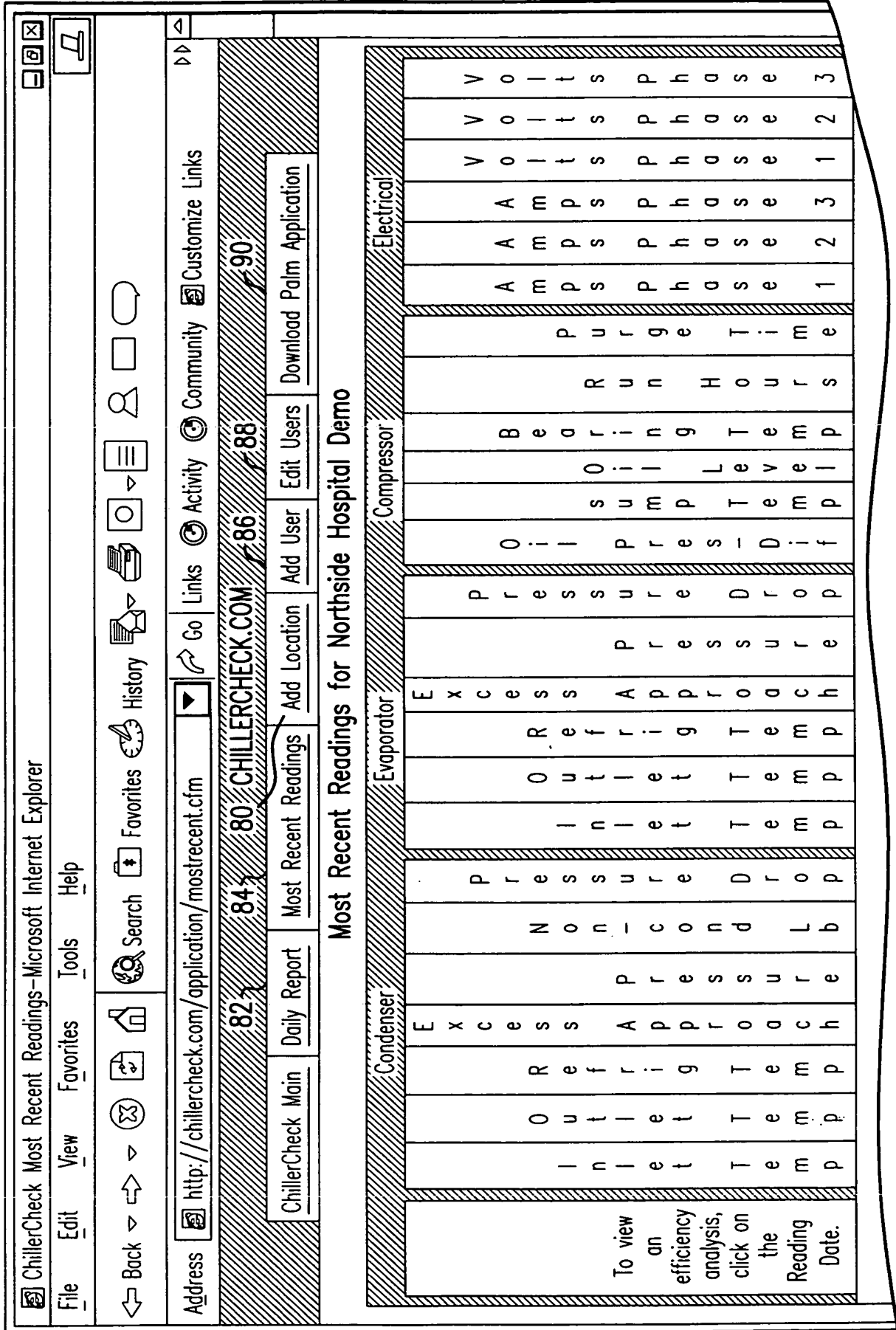
Operator Notes:
(Enter any notes you might want to record about this chiller.)

150

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Add Chiller Info

FIG. 6D



CONT'D ON FIG.7-1

CONT'D ON FIG.7-1

FIG.7

CONT'D FROM FIG.7

Internet

FIG. 7-1

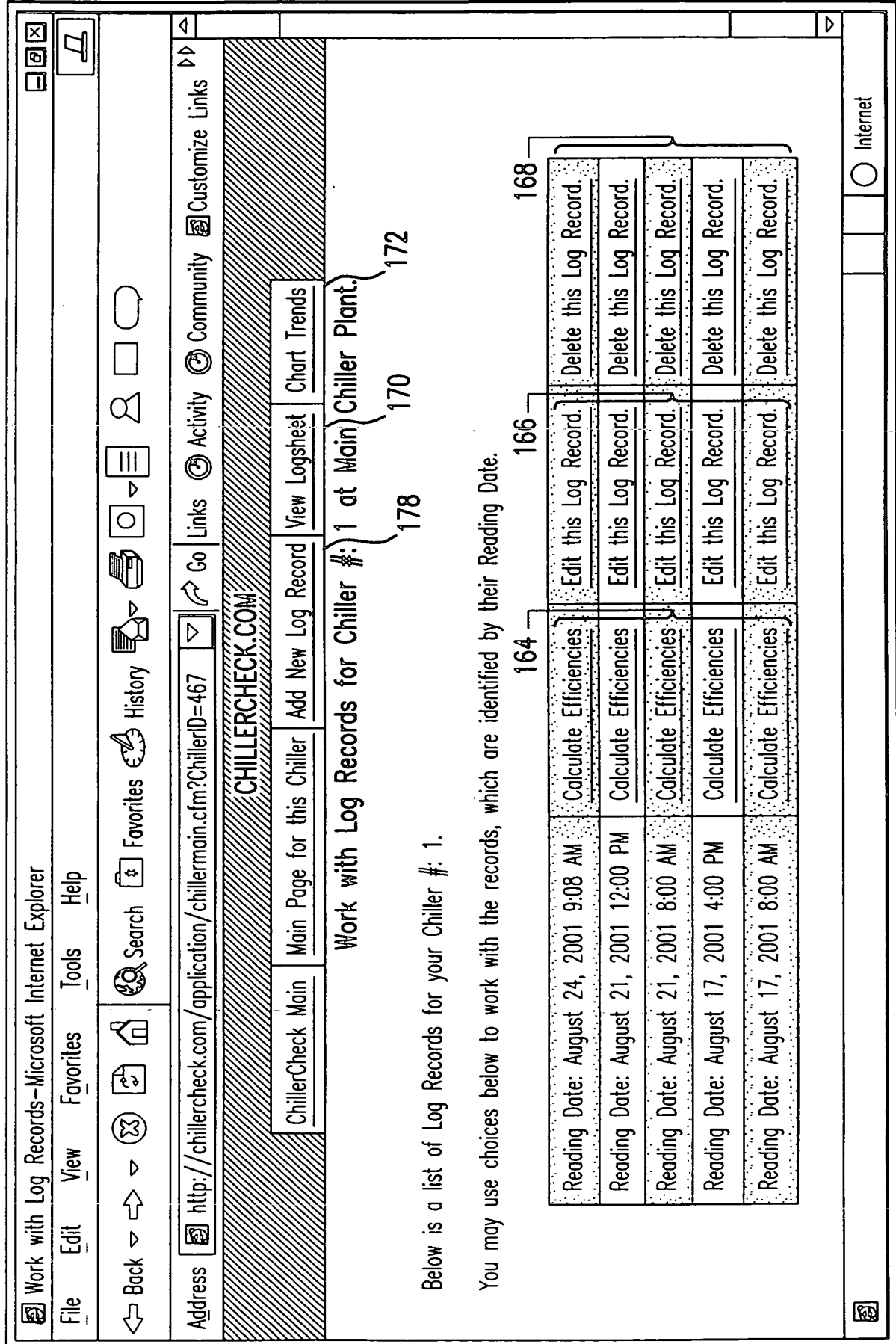


FIG.9

204290 "SB44E001"

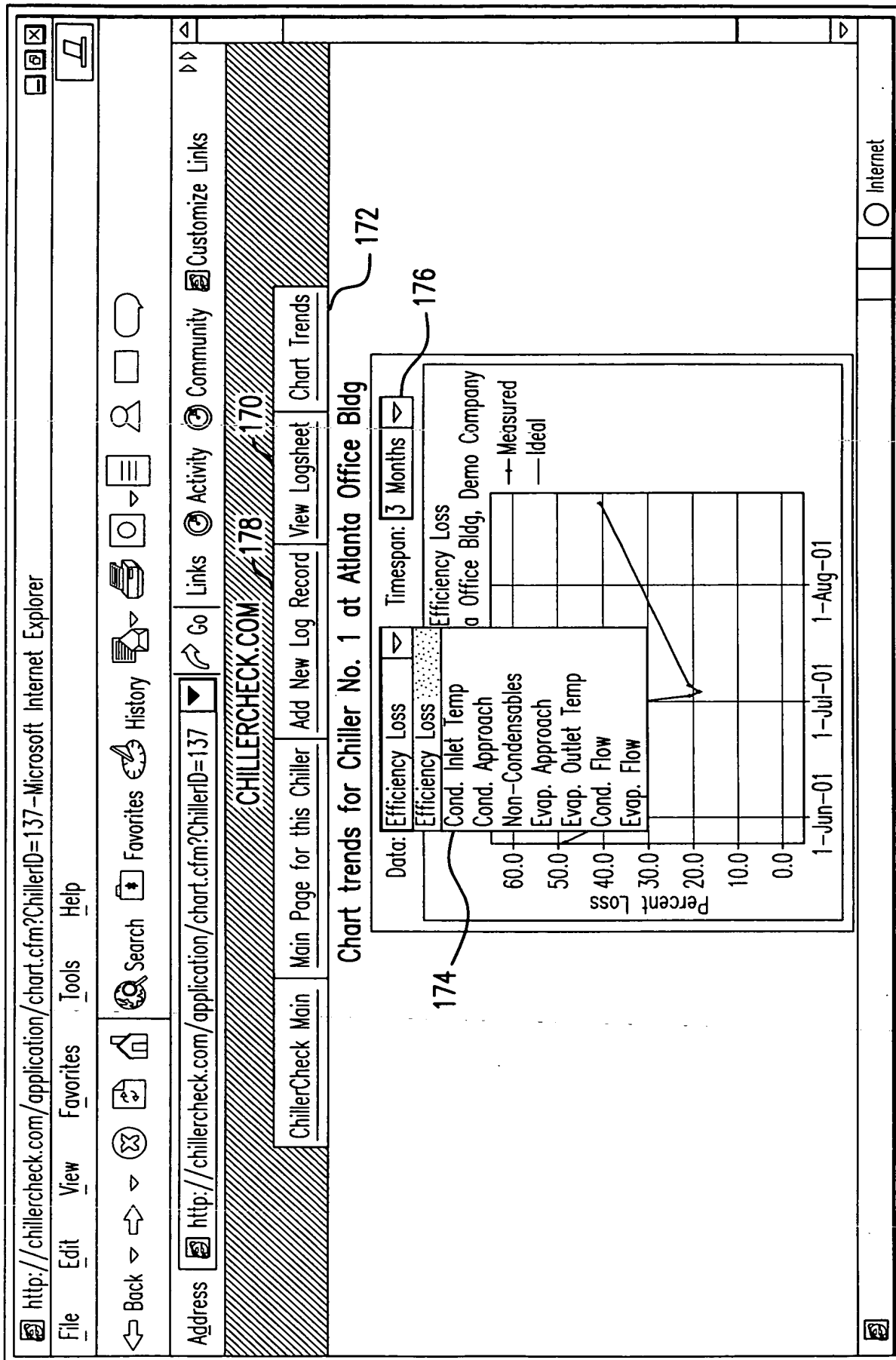


FIG.10

CHILLERCHECK.COM

170 172

[ChillerCheck Main](#) | [Main Page for this Chiller](#) | [Add New Log Record](#) | [View Logsheets](#) | [Chart Trends](#)

Add a Log Record for Chiller #: 1 at Main Chiller Plant.
 178

Please enter your readings into the form below, then click the "Add Record" button:

Log Record

Operator:	Tim
Reading Date:	August 24, 2001 180
Reading Time:	9:32 AM 182
Condenser Readings	
Inlet Water Temp:	<input type="text"/> °F 184
Outlet Water Temp:	<input type="text"/> °F 186
Refrigerant Temp:	<input type="text"/> °F 188
Condenser Pressure:	<input type="text"/> PSIG 190
Actual Condenser Water Pressure Drop:	<input type="text"/> PSIG 192
Evaporator Readings	
Inlet Water Temp:	<input type="text"/> °F 194
Outlet Water Temp:	<input type="text"/> °F 196
Refrigerant Temp:	<input type="text"/> °F 198
Evaporator Pressure:	<input type="text"/> In. Hg. 200
Actual Chill Water Pressure Drop:	<input type="text"/> PSIG 202

FIG. 11A

10034785-052402

<i>Compressor Readings</i>	
Oil Pressure (High):	<input type="text"/> lb. 204
Oil Sump Temp:	<input type="text"/> °F 206
Oil Level:	<input type="text"/> % 208
Bearing Temp:	<input type="text"/> °F 210
Run Hours:	<input type="text"/> 212
Purge Pumpout Time:	<input type="text"/> 214
<i>Electrical Readings</i>	
Amps Phase 1:	<input type="text"/> 216
Amps Phase 2:	<input type="text"/> 218
Amps Phase 3:	<input type="text"/> 220
Volts Phase 1:	<input type="text"/> 222
Volts Phase 2:	<input type="text"/> 224
Volts Phase 3:	<input type="text"/> 226
<i>Operator Notes</i>	
<div style="border: 1px solid black; padding: 10px; min-height: 100px;"> <p style="text-align: center;"><u>228</u></p> </div>	
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Add Log Record</div> 230	

FIG. 11B

10034785.06240 sheet 18 of 27

CHILLERCHECK.COM

ChillerCheck Main

Chiller #1 Main Page

Maint. Records

Add Maint. Record

Add Log Record

View Logsheet

Chart Trends

Efficiency Calculation for Chiller #1 at Admin Bldg.

Reading taken on October 10, 2001 at 1:50 PM

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Results

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Target Cost to Run for Year	\$ 54,583
Actual Cost to Run for Year	\$ 65,993
Cost of Efficiency Loss	\$ 11,410
Efficiency Loss	20.9%

Detailed Cost of Efficiency Loss

Problem	Efficiency Loss	\$ Cost	Solution
Fouled Tubes - Condenser	9.5%	\$ 5,187	Fix it.
Non-condensables - Condenser	11.4%	\$ 6,222	Fix it.

Your Condenser Water Flow is 3.6% below design.

Your Evaporator Water Flow is 21.9% below design.

There is an electrical imbalance that may be decreasing the performance of your Chiller.
 The voltage imbalance is 3.62%.

The % load at this reading time was 88.9%.

[Back to the main page for this Chiller.](#)

FIG.12

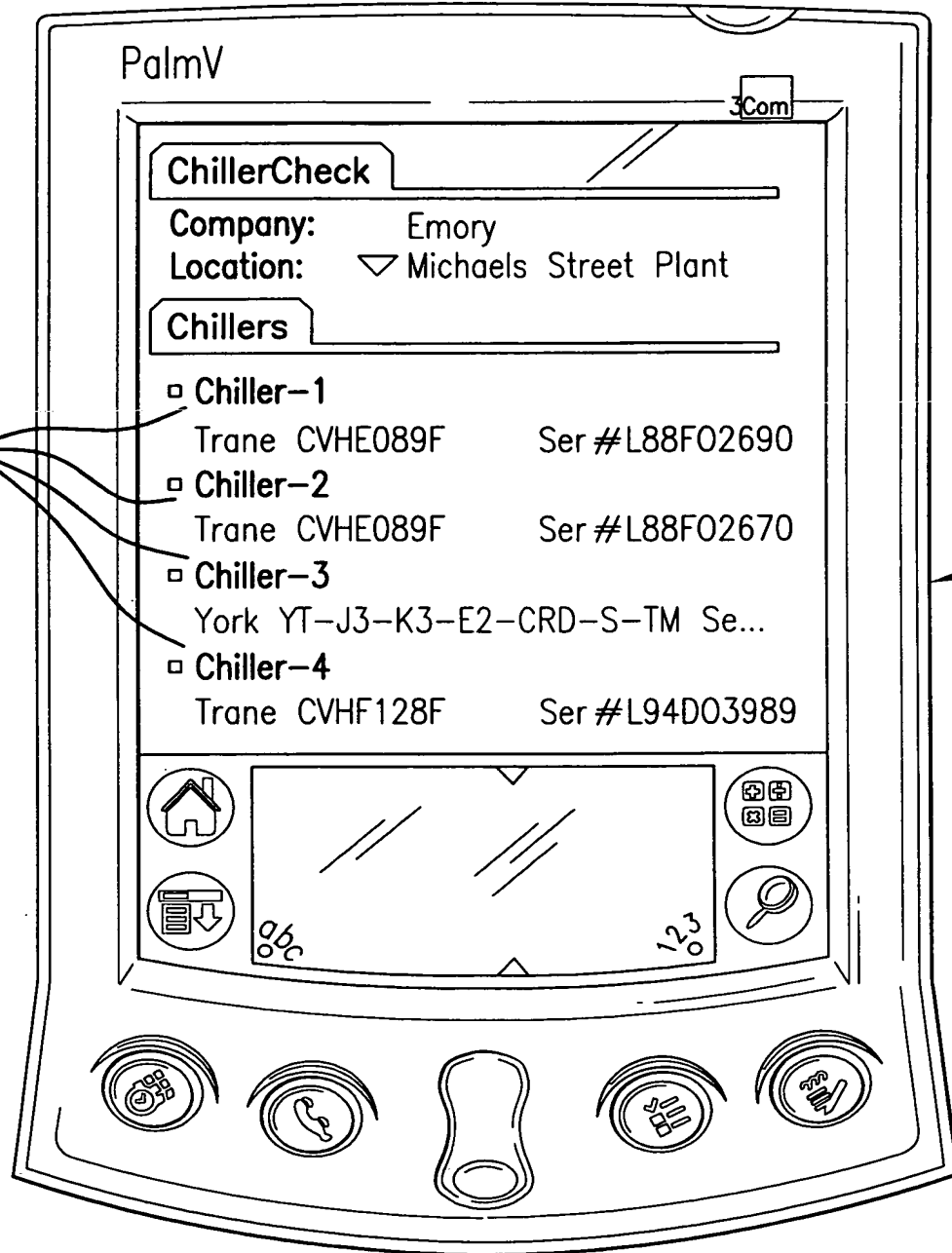


FIG.13

204290" 5824E00T

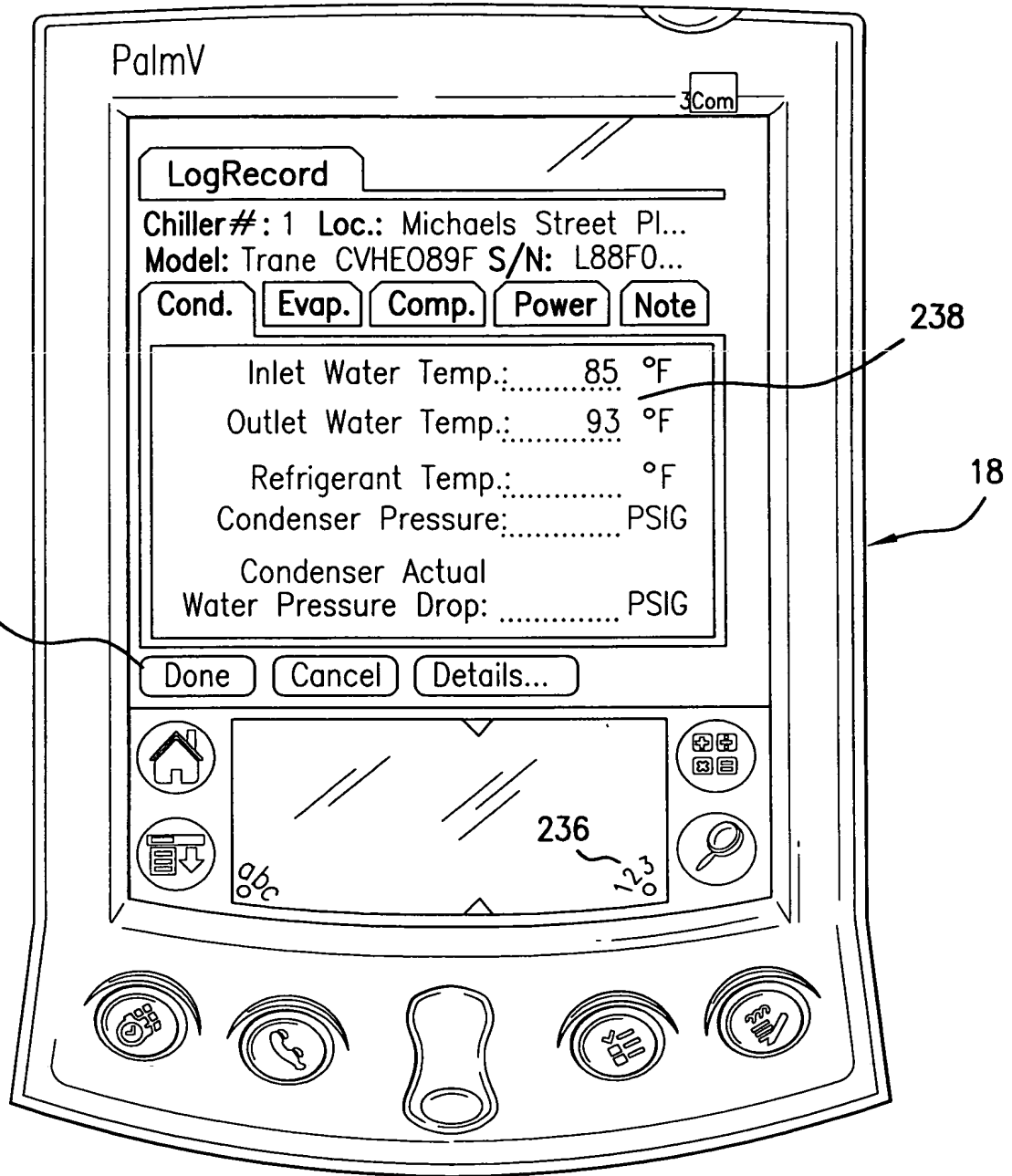


FIG.14

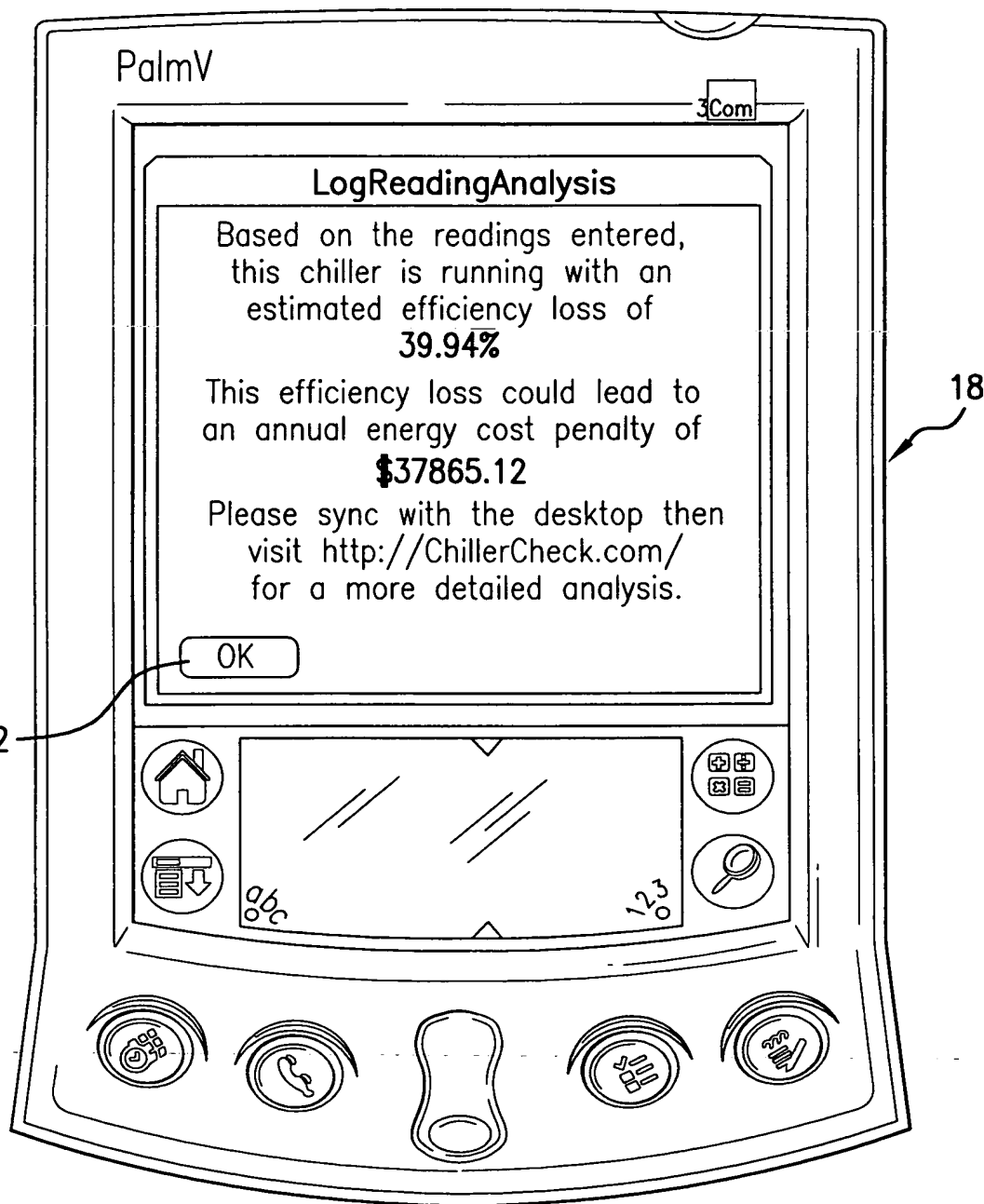


FIG.15

10034785 062402 204290 5844E001

CHILLERCHECK.COM					170	172
ChillerCheck Main	Chiller #1 Main Page	Maint. Records	Add Maint. Record	Add Log Record	View Logsheet	Chart Trends

Add Maintenance Record for Chiller #1 at Admin Bldg.
 163

Please fill in all information in the form below, then click the "Add Maintenance Record" button.
 You will then be taken back to the Maintenance page for this chiller.

Maintenance Information

Annual Maintenance Date:	Select a Month	Day	Year
Oil Maintenance			
Oil Change Date:	Select a Month	Day	Year
Date Oil Added:	Select a Month	Day	Year
Quantity of Oil Added (Gallons):			
Oil Analysis Date:	Select a Month	Day	Year

CONT'D ON FIG.16A-1

FIG. 16A

CONT'D FROM FIG.16A

Eddy Current Tests	
Eddy Current Test Date (Condenser):	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Eddy Current Test Date (Evaporator):	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Major Stop Inspection (compressor teardown)	
Major Stop Inspection:	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Refrigerant Maintenance	
Refrigerant Analysis Date:	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Date Refrigerant Added:	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Quantity of Refrigerant Added: (Pounds):	<input type="text"/>
Tube Cleaning	
Condenser Tube Cleaning Date:	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Evaporator Tube Cleaning Date:	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Purge Maintenance	
Purge Tank Reclaim Date:	Select a Month <input type="text"/> Day <input type="text"/> Year <input type="text"/>
Purge Run Time Reading When Tank Reclaimed:	<input type="text"/>

CONT'D ON FIG.16B

FIG. 16A-1

204290" 584he001

CONT'D FROM FIG.16A-1

Purge Filter Dryer Change Date:		Select a Month ▼	Day ▼	Year ▼
Major Repairs				
Major Repair Date:		Select a Month ▼	Day ▼	Year ▼
Major Repair Description:		<div style="border: 1px solid black; height: 100px; width: 100%;"></div> <div style="text-align: right;"> ▲ ▼ </div>		
Notes				
Maintenance Notes: (You may enter a note about any type of maintenance):		<div style="border: 1px solid black; height: 100px; width: 100%;"></div> <div style="text-align: right;"> ▲ ▼ </div>		
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Add Maintenance Record</div>				

FIG. 16B

10034785-0540

CHILLERCHECK.COM					178	170	172	
ChillerCheck	Main	Chiller #1	Main Page	Maint. Records	Add Maint. Record	Add Log Record	View Logsheet	Chart Trends

Maintenance Records for Chiller #: 1 at Admin Bldg.

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Below is a list of the most recent Maintenance Operations for your Chiller #1. You may click on the name of a Maintenance Type to view all records of that type.

Maintenance Type	Most Recent Maintenance
<u>Annual Maintenance:</u>	October 18, 2001
Oil Maintenance	
<u>Oil Change:</u>	October 18, 2001
<u>Oil Analysis:</u>	October 1, 2001
Eddy Current Tests	
<u>Condenser Eddy Current:</u>	September 9, 2001
<u>Evaporator Eddy Current:</u>	September 10, 2001
Major Stop Inspection (compressor teardown)	
<u>Major Stop:</u>	January 3, 2000

CONT'D ON FIG.17-1

FIG.17

CONT'D FROM FIG.17

Refrigerant Maintenance	
<u>Refrigerant Analysis:</u>	January 3, 2000
<u>Refrigerant Added:</u>	August 23, 2001 – Quantity: 100 Pounds
Tube Cleaning	
<u>Condenser Tube Cleaning:</u>	October 19, 2001
<u>Evaporator Tube Cleaning:</u>	February 5, 2000
Purge Maintenance	
<u>Purge Tank Reclaim:</u>	February 7, 2001 – Purge Run Time at Change: 1212123
Major Repairs	
<u>Major Repair:</u>	April 4, 2000 Repair Description: motor burnout
Maintenance Notes	
<u>Notes:</u>	November 5, 2001 Note: starter problems resulted in burnout

FIG. 17–1

10034785-062402